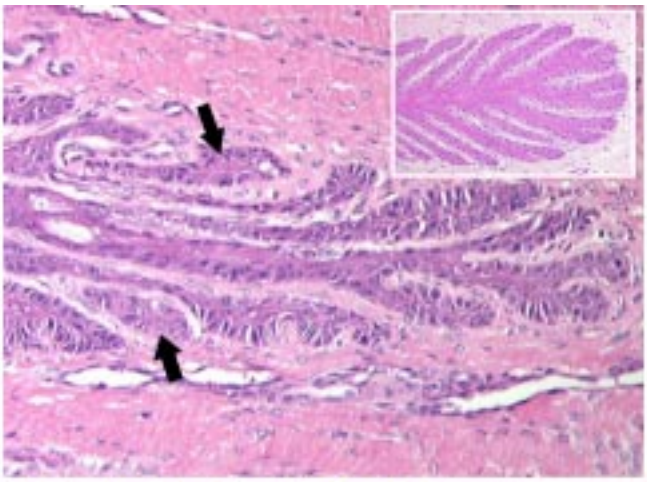
Chapter 11 Prognosis and Future Directions

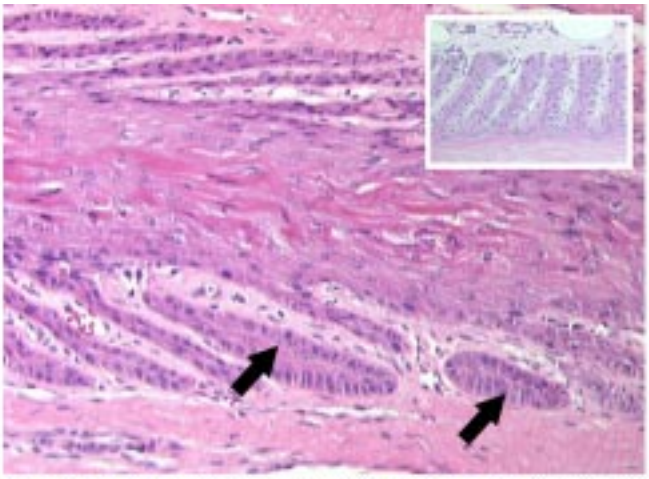
Some horses that show the clinical signs of acute laminitis recover completely if treated promptly using a combination of rational medical therapy and mechanical support. However, horses recovering from even the mildest laminitis should be rested and observed closely. If no radiographic evidence of palmar displacement of the distal phalanx within the hoof capsule exists, and the digital pulse is not palpably exaggerated 48 hours after treatment has ceased, the horse can be cautiously returned to its usual function.

If radiographs do show displacement of the distal phalanx, then the prognosis must be more guarded. Horses with a mild increase in the distance between the distal phalanx and the dorsal hoof wall, with or without rotation of the distal phalanx, often make an apparent recovery and remain sound indefinitely. However, horses with marginally greater displacement and rotation of the distal phalanx make only partial recoveries and often have a history of intermittent lameness, especially after exercise. Histopathology of the hoof lamellae of partially recovered horses shows a reduction in the number of secondary epidermal lamellae. Many of the SELs had distorted, abnormal shapes even several years after the initial episode of laminitis. Some SELs become isolated from their attachment to the PEL and exist as isolated, unattached islands adrift in the lamellar connective tissue **(Figure 11.1 and Figure 11.2)**. If the surface area of the lamellae of the inner hoof wall is reduced after laminitis, the effectiveness of the lamellar distal phalanx suspensory mechanism must also be reduced. In other words, horses developing laminitis associated with significant initial lamellar destruction, as manifest by radiographic displacement of the distal phalanx, appear never to make a complete anatomical recovery and are prone to recurrent episodes of foot pain.

Ultimately, the prognosis is directly proportional to the severity and extent of lamellar pathology. Horses with more than 15 degrees of rotation, accompanied by downward displacement of the distal phalanx into the hoof capsule within 4-6 weeks of the initial episode of laminitis, have a poor prognosis. Prolapse of the distal phalanx through an already necrotic sole, accompanied by subsolar and sublamellar infection, usually occurs. Pus will discharge from



▲FIGURE 11.1 Histopathology of chronic laminitis; lamellar tip. Despite an apparent clinical recovery by the horse biopsies of hoof lamellae show that the normal architecture has not been restored. The lamellar tips are distorted and weak and some secondary epidermal lamellae (arrowed) are not connected to the primary epidermal lamella. The inset shows the tip of a normal lamella. H&E stain.



▲FIGURE 11. Histopathology of chronic laminitis; mid-lamellar region. Despite an apparent clinical recovery by the horse, biopsies of hoof lamellae show that the normal architecture has not been restored. Some secondary epidermal lamellae (arrowed) are not connected to the primary epidermal lamella. Laminitis has compromised the surface area of attachment leaving the horse prone to recurrent bouts of the disease. The inset shows normal lamellae. H&E stain.

the coronet and the heels. Osteomyelitis and lysis of the distal margin of the distal phalanx will develop. Such cases will require months of expensive supportive care and surgery and although the occasional horse does make a surprisingly good recovery, most suffer months of crippling foot pain and recumbency, and eventually require euthanasia on humane grounds.

Outcomes

The road to recovery after a serious bout of laminitis is a rocky one. The extent of the lamellar pathology lies hidden beneath the hoof wall and we can only guess at what is really going on. Radiographs and the initial degree of pain expressed by the horse (often masked by pain-killers such as phenylbutazone) give valuable clues. Rapid sinking of the distal phalanx into the hoof capsule and involvement of all four feet make recovery unlikely.

If the horse is clearly more mobile and comfortable after shoeing, this is a sign that the chosen therapeutic technique is working. Over time, the red, necrotic solar corium, beneath the displaced tip of the distal phalanx, will re-epithelialise; turning light yellow in colour as new horn cells colonise the damaged area. The reappearance of thick, concave sole is an encouraging development. A return of hoof growth parallel to the coronary band especially at the front of the foot is also encouraging. Many horses recover to be sound enough for breeding purposes or paddock retirement. They will however require prolonged aftercare in the form of frequent expert shoeing and perhaps confinement to a personal yard. A few return to former athletic soundness.

Future Directions

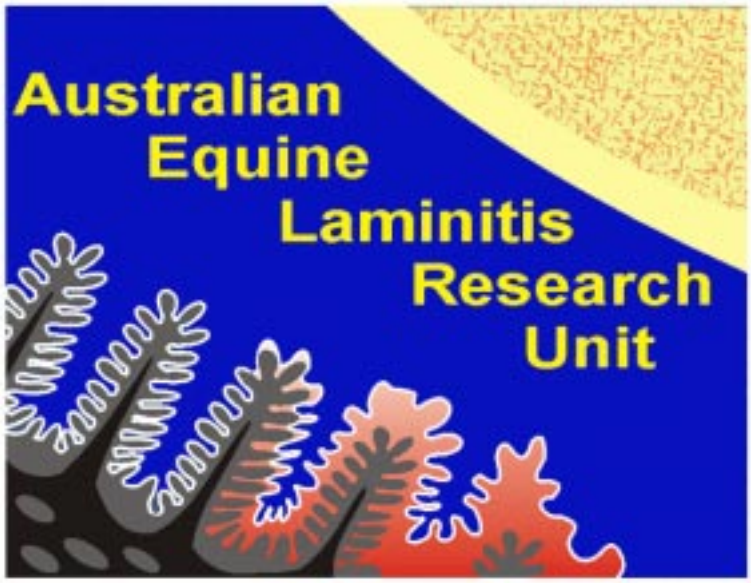
At the AELRU the search for the fundamental causes of laminitis continues. Using advanced biochemical and molecular biological techniques we plan to thoroughly investigate the link between bacterial overgrowth in the horse's bowel (particularly that induced by the key pasture carbohydrate fructan) and events occurring at the basement membrane of the hoof lamellae. The real hope for horses as they confront their crippling adversary, laminitis, is a means to effectively prevent it. Once the devastating pathological cascade of laminitis is underway, the anatomical dislocations are so overwhelming that there is little hope that mankind will develop technology to be able restore a foundered foot to normal. When the reason behind the failure of a normally robust, trouble-free attachment apparatus between hoof and bone are understood, the way will be clear to develop effective preventive strategies.

Key Points

- Recovery from laminitis is unpredictable, but generally the prognosis is directly proportional to the extent of displacement of the distal phalanx and the resultant lamellar pathology that occurs.

- The return to a normal-looking hoof takes time and prolonged aftercare will often be required. Few horses return to their former athletic soundness after chronic laminitis.

- Research at the AELRU is devoted to discovering the mechanism by which the basement membrane and lamellae separate, because prevention of this terrible disease represents a better option than trying to repair the gross anatomical dislocations once they have occurred.



Mission Statement: Elucidating the mechanism of equine laminitis to make laminitis a preventable disease.